

## CLAIMS

What is claimed is:

- 1           1.       A radio module for an electrical device, comprising:  
2           a radio transceiver;  
3           an antenna electrically coupled to the radio transceiver; and  
4           a shield disposed relative to the antenna to isolate the antenna from loading effects of  
5           components of the electrical device.
- 1           2.       The radio module, as set forth in claim 1, wherein the radio module is adapted  
2           to be secured to a side of the electrical device.
- 1           3.       The radio module, as set forth in claim 1, comprising a printed circuit board,  
2           wherein the antenna is disposed on the printed circuit board.
- 1           4.       The radio module, as set forth in claim 3, wherein the shield comprises a metal  
2           plate coupled to the printed circuit board.
- 1           5.       The radio module, as set forth in claim 4, wherein the shield is disposed  
2           relative to the transceiver to isolate the transceiver from electromagnetic interference from  
3           electrical components within the electrical device.
- 1           6.       The radio module, as set forth in claim 4, wherein the radio module further  
2           comprises a cover disposed over the antenna and adapted to extend through an opening in the  
3           side of the electrical device, the cover comprising a material that is generally transparent to  
4           radio signals.

1           7.       The radio module, as set forth in claim 1, wherein the shield comprises a  
2   housing disposed around the antenna, the housing having a portion generally transparent to  
3   radio signals from the antenna.

1           8.       The radio module, as set forth in claim 7, wherein the housing is disposed  
2   around the transceiver.

1           9.       The radio module, as set forth in claim 7, wherein the housing comprises a  
2   conductive metal.

1           10.      The radio module, as set forth in claim 7, wherein the housing comprises a  
2   polymeric material having a conductive coating.

1           11.      The radio module, as set forth in claim 7, wherein the housing comprises a  
2   periodic band-gap material.

1           12.      A radio module, comprising:  
2           a printed circuit board;  
3           an antenna disposed on the printed circuit board; and  
4           an electromagnetic shield extending from the printed circuit board around the antenna.

1           13.      The radio module, as set forth in claim 12, comprising a radio transceiver  
2   disposed on the printed circuit board and electrically coupled to the antenna.

1           14.     The radio module, as set forth in claim 11, wherein the radio module is  
2     adapted to be coupled to an enclosure and, wherein, the electromagnetic shield is adapted to  
3     extend from the printed circuit board to the enclosure.

1           15.     The radio module, as set forth in claim 14, wherein the shield comprises a  
2     portion generally transparent to radio signals produced by the radio module, the portion being  
3     disposed in facing relationship with the antenna.

1           16.     The radio module, as set forth in claim 14, wherein the antenna is disposed  
2     within the enclosure.

1           17.     The radio module, as set forth in claim 16, wherein the radio module further  
2     comprises a cover disposed over the antenna, the cover being generally transparent to radio  
3     signals at the operating frequency of the radio module.

1           18.     The radio module, as set forth in claim 12, wherein the shield comprises a  
2     metal plate disposed on the printed circuit board.

1           19.     The radio module, as set forth in claim 18, wherein the metal plate is disposed  
2     on the side of the printed circuit board opposite the antenna.

1           20.     A system, comprising:  
2             a plurality of electrical devices; and  
3             a plurality of radio modules disposed within the plurality of electrical devices to  
4                 enable the plurality of electrical devices to communicate wirelessly, wherein  
5                 each of the plurality of radio modules comprises an antenna adapted to provide

6 a maximum output at a defined load, and a member disposed relative to the  
7 antenna to establish the defined load on the antenna independent of  
8 components disposed within the electrical device in which the antenna is  
9 disposed.

1 21. The system, as set forth in claim 20, wherein at least one member decouples  
2 the antenna electromagnetically from the components within the electrical device in which  
3 the antenna is disposed.

1 22. The system, as set forth in claim 20, wherein at least one member comprises a  
2 conductive metal plate disposed between the antenna and the components within the  
3 electrical device in which the antenna is disposed.

1 23. The system, as set forth in claim 20, wherein at least one radio module  
2 comprises a radio transceiver coupled to the antenna.

1 24. The system, as set forth in claim 23, wherein at least one member is disposed  
2 around the radio transceiver.

1 25. The system, as set forth in claim 23, wherein at least one of the plurality of  
2 electrical devices comprises a processor coupled to the radio transceiver.

1 26. The system, as set forth in claim 20, wherein at least one antenna is  
2 disposed on a printed circuit board securable to an enclosure.

1           27.     A method of manufacturing a radio module for use within an electrical device,  
2     comprising:  
3           tuning an antenna to produce a maximum output at a defined load; and  
4           disposing a shield relative to the antenna to establish the defined load on the antenna  
5     independent of influences external to the antenna within the electrical device.

1           28.     The method, as set forth in claim 27, wherein disposing a shield comprises  
2     disposing an antenna housing around the perimeter of the antenna.

1           29.     The method, as set forth in claim 27, wherein disposing a shield comprises  
2     disposing the antenna on a printed circuit board and disposing a conductive plate on the  
3     printed circuit board opposite the antenna.